5. RESEARCH METHODS

This chapter presents the design of field and laboratory methods developed to address Phase III data recovery excavations at Neuse Levee. Geological methods are discussed in Chapter 2.

BACKGROUND RESEARCH METHODS

Background research included accumulation of comparative data on the paleoenvironment and archaeology of the Piedmont and Coastal Plain transition zone. This was accomplished through literature review as well as consultations with other researchers in the region.

This background research utilized information available in regional, state, and national repositories, such as the Office of State Archaeology (OSA) library, the University of North Carolina library, and TRC's reference library. Published sources consulted for background information included works by Baker and Hargrove (1981), Cable (1991, 1992, 1996), Claggett and Cable (1982), Claggett et al. (1978), Coe (1964), Davis (1987), Gunn, Idol et al (1997), Gunn and Lilly (1997), Gunn et al. (1998), Hargrove (1985, 1986, 1987, 1991), Hawkins (1980), Lilly et al. (1995), Parker (1990), Phelps (1983), Rogers (1989, 1993), Ward (1983), and Winslow (1990).

FIELD METHODS

The field methods used at 31WA1137 were specifically designed to gather data relevant to the six research domains noted in the last chapter. Hand excavation of the site was undertaken to gather data on artifact and feature distributions and was a major focus of the data recovery investigations. Details concerning the selection and extent of those excavated areas are provided below.

Site Preparation

Fieldwork commenced with re-establishment of the site grid and location of the site data that were used during Glover's (1993) excavations. Additional nails were then placed on a 10-m grid across the site.

Following completion of this initial survey work, a map was made showing the location of the site grid in relation to nearby cultural and natural features such as roads, culverts, Neuse River bank, and trees. The levee trends northwest to southeast; to accommodate the orientation of the levee northwest was designated grid north. Glover's test unit was relocated with reference to a large tree. A topographic map was then made of the ground surface prior to excavation. This base map was used to record all cultural and natural features in three-dimensional space. This map was updated daily and showed the dimensions of all excavation units and major cultural and natural features at a uniform scale. More detailed maps of individual feature and excavation units were keyed to this map and the site grid.

Backhoe Trench

A backhoe trench was excavated through the site perpendicular to the axis of the levee (magnetic northeast-southwest). In terms of grid orientation, this is east-west. The excavation and description of the backhoe trench are in Chapter 2, geology. The backhoe trench revealed the stratigraphy of the site, both before and during human occupation. A report on this work is presented in Chapter 2.

Excavation of Units

Hand-excavated 1-x-1-m units were placed across the site to gather additional data on artifact distributions and to investigate the intact deposits. Excavation units were assigned test unit numbers sequentially from the beginning of the excavation (i.e., TU 1, TU 2, etc.); they were also addressed by grid coordinates (E110 N95). Strata were designated by Arabic numbers, and arbitrary excavation levels within strata or substrata with decimal numbers added to the stratum; for example the second arbitrary level within stratum 2 was designated stratum 2.2. Thus, the full address of a level is E110 N95 S2.2. In general, the unit excavations began with individual units, which were expanded into two larger block excavations as opportunity provided, depending on the density of cultural material and the presence of features. Eventually it became clear that the site should be excavated in two blocks on either site of the backhoe trench.

Block A

A block excavation of 31 1-x-1-m units was placed across the northern portion of the site, grid north of the backhoe trench. Two outlying units were also excavated. Block A is characterized by approximately 1.1 m of culture bearing sediments on the crest of the levee, and contained concentrations of large primary flakes and FCR features.

Block B

A block excavation of 22 1-x-1-m units was placed across the southern portion of the site south of the backhoe trench and three outlying 1-x-1-m units. The block circumscribed Glover’s Phase II excavation unit, and is characterized by approximately 1.1 m of culture-bearing sediments on the crest of the levee to the east and 2.0 m of culture-bearing sediment to the west on the riverward side of the levee. Block B contained concentrations of large primary flakes.

Unit Excavation Methods

All of the units were excavated in arbitrary levels within natural strata. Initial exploratory units were excavated in 10-cm levels within natural strata until evidence of living surfaces was discerned. When living surfaces were found in the block excavations, subsequent units were excavated in 5-cm levels within natural strata. A 5-cm increment was selected because of the observation that when roots follow occupation floors, they appear to average about 3 cm in diameter. Such a root penetration would bump artifacts lying on a theoretical occupation floor up or down about 2 cm. Thus, a 5-cm cut vertically adjusted to center on an occupation floor should capture most of the debris originally left on the floor after root penetration, a standard form of bioturbation (Gunn and Brown 1982). Of course, other forms of bioturbation exist, such as vertical borrowing, but they are less amenable to modeling. Provided a coherent occupation floor, preferably from one camping event, was present, addition of relatively small amounts of extraneous material from other camp events from other levels by bioturbation should not obscure artifact relationship based on correlated attributes of artifacts (Gunn and Mahula 1977). Excavations were terminated after a culturally sterile level (one 10-cm level or two 5-cm levels) below the lowest culture bearing level.

All sediment removed from the units was screened through ¼-inch wire mesh for uniform artifact recovery. Stratigraphic profiles of two adjoining walls of all excavated units were recorded, including their predominant Munsell color, and photographed in black and white print and color slide formats. Sediment samples for phytolith, geochemical, and sediment grain size analyses and OCR dating were taken from a 1-cm slit every 5 cm in a standard column from at least two units at each site.

A unit level form was completed for every level of each stratum excavated in each unit, and a unit summary form was completed following the termination of each unit. These forms included a plan map showing all features and other soil anomalies, explanation of any changes in the basic excavation strategy, soil descriptions (including Munsell color identifications), a list of photographs taken, and a list of all artifact bags, flotation samples, and other samples removed from the unit. The top of each level within each stratum was scraped and examined for the presence of features or other buried soil horizons, including those of cultural and natural origin. If no features were present, the excavation of the next level proceeded. Any features encountered were excavated using procedures described below. Profile drawings were made as necessary to facilitate interpretation.

All artifact and flotation samples were placed into bags labeled with the site name, site number, provenience, date and method of collection, initials of collector, and bag inventory number. All bags were numbered sequentially and recorded on field inventories that were checked in the field lab.

Feature Recordation and Excavation

Standardized, accepted methods were used to record and excavate features to ensure that a variety of data was recovered from each one. All possible cultural features were flagged when first exposed and given a unique number on a site-by-site basis for subsequent tracking purposes. When features were identified, they were carefully defined by trawling, mapped in plan view, and plotted on the site map. A detailed plan map was drawn and color slide and black-and-white photographs were taken. All features were cross-sectioned, and one half was excavated and mapped in profile. The remainder of the fill was then removed, and the completely excavated feature was photographed and drawn. If a feature was determined to be noncultural in origin (e.g., a rodent burrow or tree root), excavation was terminated.

A maximum 10-liter flotation sample from each feature or subfeature, or discrete level within a feature, was extracted and subjected to flotation analysis in an attempt to recover minute floral and faunal materials. Minimally, one flotation sample was collected for each excavated cultural feature. If less than 10 liters of feature fill was recovered from a cultural feature or natural stratum, the entire feature or stratum was collected and subjected to flotation analysis.

Information generated from feature excavation was recorded on standardized forms. Standard soil descriptions were completed for each fill zone, including Munsell color identifications. Notes were taken concerning feature form, dimensions, contents, stratigraphic relationships, and likely function. The plan and profile maps for each feature were appended to the form. Radiocarbon samples were taken as appropriate from each feature.

Sediment samples (250 g) for geochemical analysis (phosphorus and pH) were taken from each feature matrix as well as from outside of the feature for comparative purposes. Research has demonstrated the utility of geochemical analysis in feature interpretation (Millis et al. 1995). In some instances, hearths do not contain seeds or other food remains, especially if used repeatedly over time. General cleaning activities by site inhabitants can move macroremains from primary to secondary contexts (e.g., from around the hearth to outside the feature). Moreover, elevated or reduced levels of phosphate and pH can help distinguish whether a hearth was utilized for food processing or simple heating fires.

Standard sediment samples (250 g) were taken from feature fill contexts and buried organic horizons for phytoliths, sediment grain size, and/or OCR analysis. Minimally, two samples were taken within each organic zone and one sample was taken from directly above and below the buried A horizons. Selected samples from features were also retained for amino acid analyses.

Photography

Various types of photography were used to document the ongoing process of excavating the sites. In addition to the normal black-and-white prints and color slides required by the state, color prints and Polaroid photos were taken for public relations purposes and for immediate analysis purposes.

LABORATORY METHODS

General Processing

All cultural materials recovered during the field investigations were handled, transported, processed, and prepared for curation in TRC's laboratory in Chapel Hill according to appropriate standards developed for federally recognized and approved curation repositories. The specific procedures that were used to complete the laboratory processing and artifact analysis follow.

The laboratory processing included the preparation of a detailed inventory of all recovered data to ensure that all materials were present and organized, and to facilitate subsequent analyses. Artifacts were cleaned using techniques appropriate to the nature and condition of the materials. Any artifacts that required specialized handling, treatment, and conservation (such as perishable materials, most generally charcoal) were separated from other artifacts and set aside for conservation.

Following their stabilization, all artifacts were cataloged. The laboratory analyses emphasized description of the overall artifact assemblage, with the artifact catalogs organized so that the data base can be manipulated by future researchers. The goal of the analysis was not only to provide the artifact data needed to address the current research design, but also to provide an archaeological archive useful to future researchers.

Ceramic Artifacts

The analysis of ceramic attributes from the site at Neuse Levee, and from the Wakefield Creek sites, was designed to detect variation within morphological, technological, and stylistic parameters and to suggest sources of synchronous and diachronic variation within the assemblages. The following is a discussion of the attributes examined. An elaboration of their importance is in the discussion portion of this report. The list of codes and the Neuse Fall Line Ceramic Data Base are in Appendix 3. The data base was designed to be broadly compatible with Davis's (1987) analysis of Piedmont ceramic sites.

Vessel Portion

This attribute refers to the vessel portion or portions represented by a sherd. In the absence of whole vessels, this attribute helps index morphological variation within and between ceramic assemblages. Four categories were present in the three assemblages analyzed: unspecified body, rim/lip, rim/lip/shoulder, and base. Unfortunately, only four base sherds occurred in the Neuse Levee assemblage. This fact, combined with small sizes of rim sherds in most cases, hampered attempts to reliably describe vessel morphology. It may also indicate a transient nature to the ceramic assemblage. An unusually high proportion of rims was found, probably the most likely part of a vessel to be broken in a temporary location and left behind.

Sherd Size

Sherd size categories can be used to make inferences concerning modes of vessel discard as well as contemporaneity of two or more sherd types found in possibly mixed contexts (Davis 1987:189; Schiffer

1976:30–34). Sizes were measured using a template of concentric circles of the following ranges of measurement: <2 cm, 2–4 cm, 4–6 cm, 6–8 cm, 8–10 cm, and >10 cm.

Sherd Thickness

Ceramic wall thickness has important technological implications for vessel performance and use. The maximum width of each sherd was recorded and a mean thickness was computed. Sherds were assigned to a general size range: <4 mm, 4–6 mm, 6–8 mm, 8–10 mm, or >10 mm. Lip thicknesses for rimsherds were recorded. Mean thickness for each sherd was translated into a mean for the site assemblage as a whole.

Exterior Surface Treatment

This category refers to the type of treatment applied to the exterior surface of a ceramic vessel prior to firing. In addition to decorative purposes, the application of a surface treatment serves to further weld the coils together, provides a "non-slip" surface, and improves the absorption of heat by increasing the surface area (Rice 1987:232). It also prevents wet clay from adhering to the paddle. The following categories and subcategories of surface treatments occurred in the Neuse Fall Line region assemblages.

<u>Fabric-Impressed</u>. This category is produced by the application of a fabric swatch–wrapped paddle to the damp clay surface of a vessel so that the negative impressions of the fabric remain in the clay. The category was subdivided into five subcategories based on examination of sherds from the three Wakefield Creek sites, to account for variation in the fabric-impressed category. Although fabric impressions of similar scale were observed in the Neuse Levee assemblage, the Neuse Levee fabric impressions were not as distinct.

- The *Fabric I* subcategory is a fabric of interlaced, heavy- to medium-sized weft with a visible warp element (Figure 5.1, Table 5.1). The warp elements are 1.5–4.0 mm in diameter and are roughly parallel. Weft elements are 1.0–1.5 mm in diameter. Weft count is 3–4 per cm (Figure 5.1).

- The *Fabric II* subcategory consists of a fabric of interlaced medium- to heavy sized, closely spaced wefts with no visible warp element. Wefts are spaced 3–4 per cm.

- The *Fabric III* subcategory is identical to the Fabric I (visible warp) except for its smaller (0.5–1.0 mm), more closely spaced (6–8 per cm) weft sizes.

- The *Fabric IV* is identical to the Fabric II (no visible warp) except that the weft diameter is larger (1.0–1.5 mm).

- The fifth subcategory, fabric-smoothed, refers to those sherds that have been roughly hand- or tool-smoothed after the application of a fabric-wrapped paddle. Weft impressions in this subcategory have not been completely eradicated by smoothing. In some instances fabric impressed sherds exhibit patches of plainly smoothed surfaces missed by paddling.

Fabric impressions with visible warps always appear oriented perpendicular to the rim.

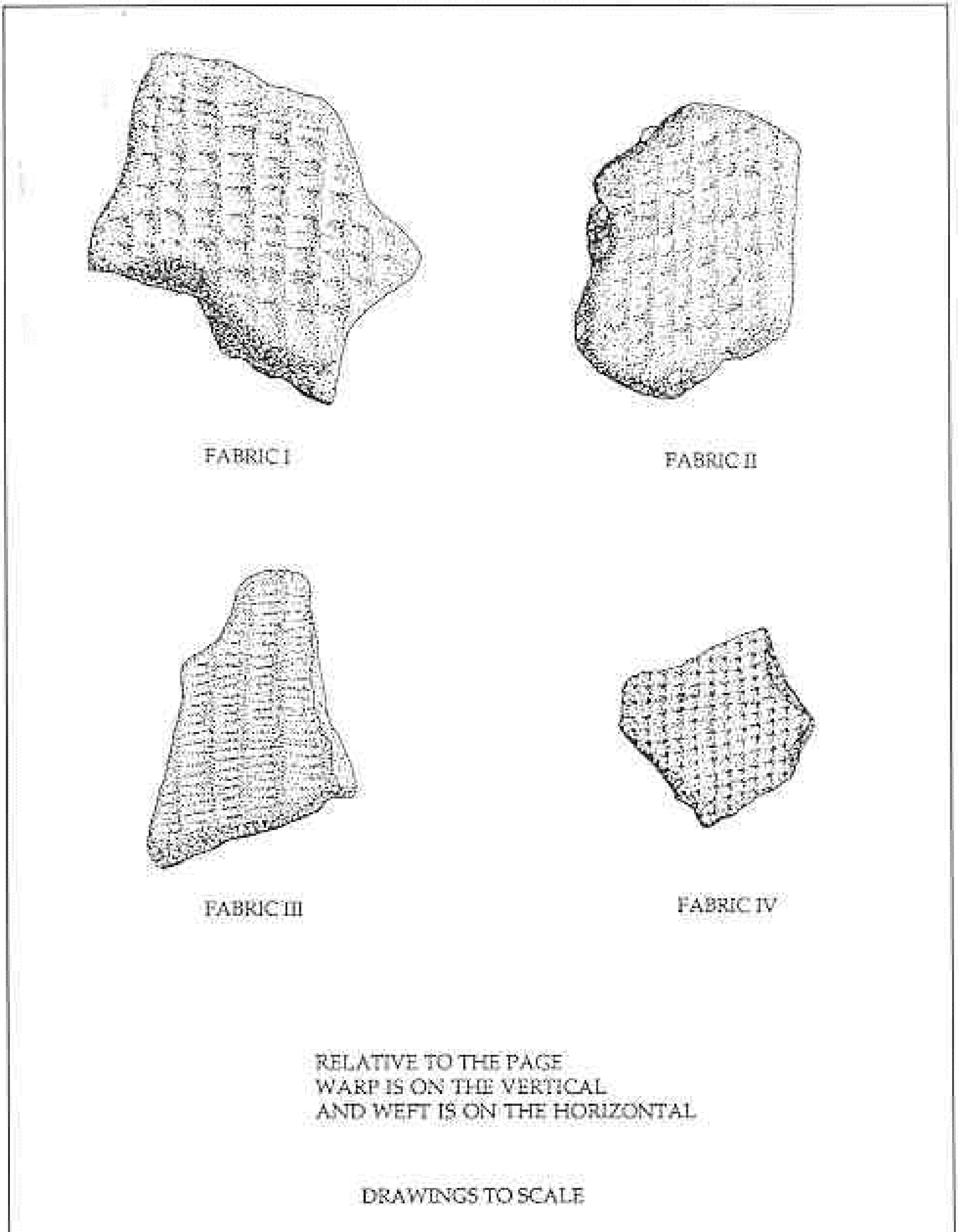


Figure 5.1. Fabric Impressions from Neuse Fall Line Ceramics.

Table 5.1. Fabric-, Cord-, and Net-Impressed Surface Treatments.

Subcategory	**Warp Size/mm, Count/cm**	**Warp Spacing mm**	**Weft Size/mm, Count/cm**	**Figure**
Fabric I	1.5–4.0		1.0–1.5 3–4	5.1
Fabric II	Not Visible	N/A.	1.0–1.5 3–4	5.1
Fabric III	1.5–4.0		.5–1.0 6–8	5.1
Fabric IV	Not Visible	N/A.	1.0–1.5 3–4	5.1
Fabric Smoothed	Perpendicular to the rim		Partly Visible	
Cord I	.5–1.5 tightly woven	5–7	Not Visible	5.2
Cord II	1.5–2.5	2–3		5.2
Net Impressed	.1	5–6	1.0 2	5.3

Cord-Marked. This category is produced by the application of a cord-wrapped paddle to the wet clay surface of an unfired vessel. Variation occurs in widths of lines, type of cordage twist used, and depth of impression. Cord-marked sherds were divided into those that exhibited weft (Figure 5.2), and those that were more tightly woven with no visible weft element (see Figure 5.2). No cord marking was observed in the Neuse Levee assemblage. However, the style has been found in the Neuse Fall Line region.

• In cord-marked sherds with no visible weft (*Cord I*, Figure 5.2, see Table 5.1), the warp element was between 0.5 and 1.5 mm in diameter. Warp elements were generally spaced 5–7 per cm.

• Cord-marked sherds without visible weft elements (*Cord II*) have warps ranging between 1.5 and 2.5 mm in diameter, and were typically spaced 2–3 mm apart.

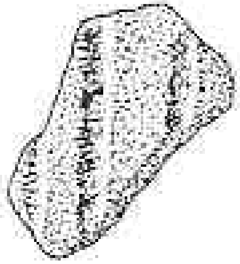
• A third subcategory, cord-smoothing, refers to those sherds with visible cord impressions that have been partially eradicated by smoothing.

It is impossible to determine from small sherds whether such a treatment was typical for an entire vessel. Cord marking is always perpendicular to the rim.

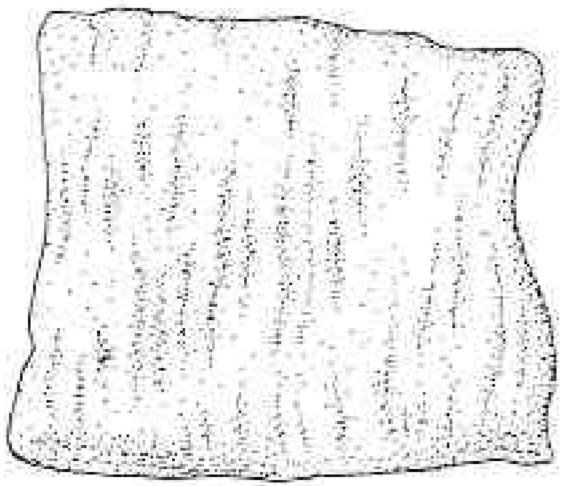
Net-Impressed. Sherds from one vessel at Neuse Levee exhibited net impressions. The net was knotted about 5 cm (Figure 5.3). One occurrence of what appears to be a net-impressed pot bust was found at Neuse Levee. Apart from net-impressed sherds found by Hargrove (1998) at 31WA1398, this was the only incidence of net-impressed surface decoration from in the sites under consideration in this study.

Unidentifiable (Roughly Smoothed). This attribute occurred on the upper neck portions of rimsherds, although other indeterminate vessel portions could have been characterized by this surface finish type.

Unidentifiable. This category refers to sherds that lack distinguishing surface finish characteristics due to flawed firing or post-depositional processes.



CORD MARKED I



CORD MARKED II

RELATIVE TO THE PAGE
WARP IS ON THE VERTICAL

DRAWINGS TO SCALE

Figure 5.2. Cord Marks on Neuse Fall Line Ceramics.

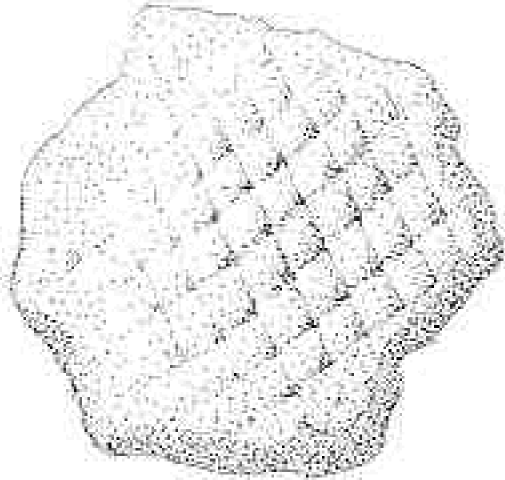


Figure 5.3. Net Impressions on Neuse Fall Line Ceramics

Interior Surface Treatment

This attribute refers to the type of finish applied to the interior surface of a vessel prior to firing. Serving to weld further the clay coils of the vessel walls, interior surface treatments have important technological implications for the functioning of a ceramic vessel. Changes in the frequency of certain interior surface treatments could reflect changes in subsistence systems. Interior surface treatments identified from ceramics include the following.

Scraped. The vessel interior exhibits pronounced striations as a consequence of scraping by a serrated tool to thin the vessel wall. It is possible that most or all interior surfaces of vessels were scraped prior to subsequent smoothing.

Scraped-Smoothed. This category refers to interiors that have been scraped and subsequently smoothed, leaving visible striations on portions of the interior surface.

Plain (Roughly Smoothed). The interior was smoothed to eradicate any evidence of tooling, but the rough surface has not been eradicated. Sherd interiors possess protruding temper particles and finer particles within the clay itself have not been brought to the surface (floated) by careful smoothing.

Plain (Uniformly Smoothed). The interior surface has been carefully smoothed, eradicating compactions and floating finer clay particles to the surface. A highly smoothed interior retards the loss of liquids and so prevents the contents from cooking dry (Marshall 1988:105).

Unsmoothed. No visible signs of smoothing are apparent above that needed to weld the vessel coils together.

Indeterminate. The interior surface is unrecognizable due to spalling during the firing process or during use.

Temper

Temper is any nonplastic material added to the clay matrix. Variation in temper type, size, and amount has functional significance relative to vessel performance, and has proven to be a valuable chronological and typological aid to archaeologists. Temper in the Neuse basin sites ceramics consists entirely of crushed quartz or quartz sand. In some specimens it is difficult to separate intentional additives from naturally occurring particles. Variation occurs in size and shape of temper and relative amounts added to the paste. Temper size categories were adapted from the Wentworth scale: pebble (>4 mm), granule (2–4 mm), very coarse/coarse (0.5–2.0 mm), fine/medium (0.25–0.5 mm), and very fine (<0.25 mm). Quartz temper <0.5 mm is referred to as sand. Temper shape was recorded as angular, subangular, or rounded based on a standardized template (prepared by Gamma Zeta Chapter, Sigma Gamma Epsilon, Kent State University). Temper amount was somewhat subjectively divided into heavy, medium, and light based on relative amounts of visible inclusions within the paste.

The addition of temper serves primarily to reduce shrinkage in unfired vessels, which could lead to severe cracks in the vessel's wall. This flaw is more problematic in larger vessels than smaller ones (Palmour, cited in Marshall 1988:103). Crack initiation prior to vessel firing is reduced by the addition of temper particles, which adhere to clay particles (Braun 1983:123). In fired vessels temper plays a role in the mechanical properties of the vessel during its use life, especially in regard to thermal shock resistance for vessels intended to be used over direct heat for cooking, and in regard to mechanical strength. Vessels intended for use directly over fire must endure the stresses associated with the cycles of heating and cooling.

Cracks that lead to vessel failure are caused by uneven rates of expansion and contraction within the vessel walls. Ideally, a temper will possess a thermal expansion coefficient similar to that of the clay matrix. Smaller temper particles will also tend to increase a vessel's resistance to crack initiation. However, by increasing the size of temper particles, a potter reduces the tendency of initiated cracks to propagate further (Bronitsky and Hamer 1986:97, 98), and larger temper size offers better resistance to repeated thermal shock or mechanical stress (Braun 1982:184; Steponaitus 1983:43–45).

In general, increased amounts of temper and vessel strength are negatively correlated (Shepard 1956:131–132), so untempered vessels offer better resistance to impact. Yet the addition of temper allows larger vessels to be constructed. Because of its high thermal expansion coefficient, quartz is a poor choice of tempering material relative to other tempers available during prehistory, such as crushed mussel shell. Increased thermal shock resistance is equally desirable during vessel firing (Rye 1981), so vessels with smaller temper particles are not necessarily cooking vessels. Much variability is the result of a reconciliation between the relative advantages and disadvantages of any particular choice in attribute combinations.

Thinner vessel walls reduce the possibility of uneven expansion and contraction during heating/cooling. Because of the inferior expansion properties of quartz, it would be important for the manufacturer a cooking vessel to use smaller particles (Braun 1982:185).

Exterior Sherd Color

This category measures the color of sherd exteriors by Munsell values. Sherd color could be the consequence of natural impurities in the clay or the time, temperature, or atmosphere of the firing (Rice 1987:333). Chemical analysis of sherd composition would make definitive determinations of the source of color. However, it should be noted that any sherd will be black if it is fired in a reducing atmosphere. Only the non-black sherds are therefore indicative of sherd chemistry apart from firing atmosphere. Colors also included dark red (2.5YR 4/6), strong brown (7.5YR 5/6), and very pale brown (10YR 8/4).

Interior Sherd Color

Sherd interior colors included the four exterior color categories as well as light grayish brown (10YR 6/2), dark yellowish brown (10YR 4/4), and very dark grayish brown (10YR 3/2).

Rim Form

This attribute refers to the shape of a vessel as viewed in profile and terminated by the lip. Three attribute states were coded: straight, everted, and inverted.

Lip Form and Thickness

This attribute could be both functional (relating to properties of vessel use) (Hally 1986:280–281) and stylistic. Recorded lip forms include flat straight, flat thickened, rounded straight, rounded thickened, folded, and pointed (following Davis 1987) (Figure 5.4). All lips described as flat were never carefully and evenly flattened, but rather were roughly smudged with fingers or a finishing tool. One specimen from Neuse Levee was folded and impressed with a dowel. Lip thickness was recorded in millimeters for each sherd.

Other Attributes

Sherds also were examined for the presence/absence of coil breaks and exterior and interior sooting. Soot deposits, consisting of distilled resins and solid carbon, form on portions of a vessel's exterior when exposed above the cooking fire (Hally 1983:7–10). Exceptions to this are when a vessel surface has been eroded, when soot is intentionally burned away by the vessel user, when small vessels are used over large, hot fires, or when vessels are placed within embers (because flaming combustion is required for

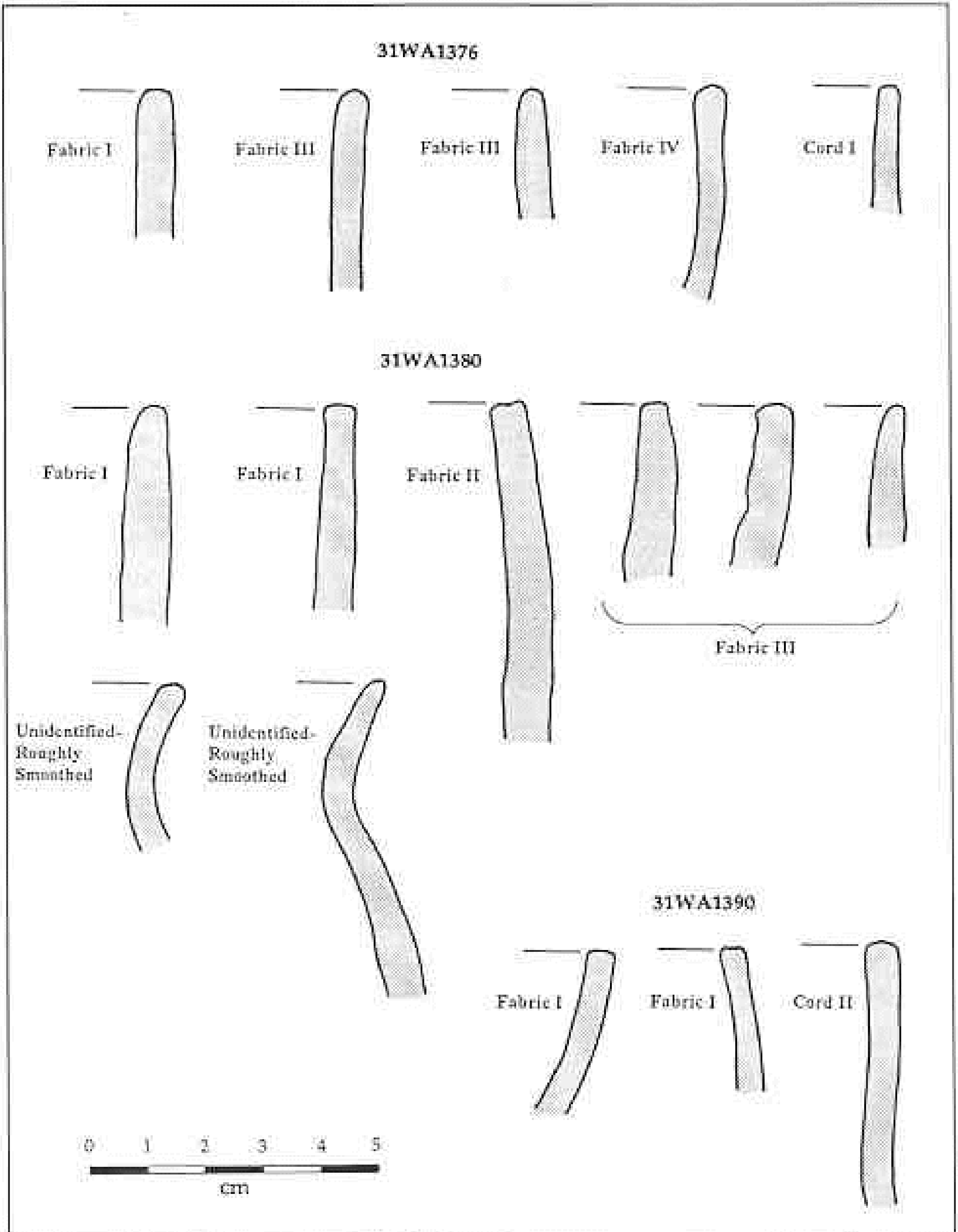


Figure 5.4. Rim/Lip Forms on Neuse Fall Line Ceramics.

soot formation) (Hally 1983:10). It is also important to remember that soot formation does not occur evenly over a vessel surface, so small sherds of a large sooted vessel could exhibit no soot deposits. No sooted sherds were recovered from the Wakefield sites, but they appeared frequently at Neuse Levee. A large number of sherds at all sites exhibited coil breaks.

The final step in the analysis consisted of assigning type names to as many of the ceramic sherds as possible. The classification was aided by a number of detailed studies of ceramics in the region, including those by Coe (1964), Crawford (1966), Eastman (1991), McCormick (1970), Oliver (1985), and Phelps (1984). A number of survey and site reports from surrounding areas also provided valuable data, including those by Claggett et al. (1978), Hargrove (1987, 1991), Phelps (1983), and Ward (1983). Detailed information on recognized ceramic types and their temporal significance is provided later in Chapter 11.

Lithic Artifacts

Chipped Stone

The chipped stone assemblage was sorted into formal tool, expedient tool (retouched and/or utilized flakes), and debitage (manufacturing waste) categories. Chipped stone tools were sorted into primarily functional categories, including hafted bifaces, other bifaces, retouched flake tools, and other categories as needed. Information on raw material type (e.g., rhyolite quartz, quartzite, etc.) was recorded for all chipped stone tools (see Appendix 1).

Projectile points and other items potentially provide significant chronological data, due to the demonstrated association of particular artifact styles with certain temporal periods. Typologies used in the Southeast and Middle Atlantic were employed for the analysis of these artifact classes to estimate temporal placement and function, and to identify relationships with other artifact traditions, wherever possible. The artifact typologies used included Coe (1964), Justice (1987), Oliver (1985), and other regional schemes as appropriate.

Beyond typology and chronology, we attempted to understand breakage of points in terms of the most likely circumstance under which points would be discarded and the life history of points (Figure 5.5).

- *Tips or terminal fragments.* Terminal fragments represent the action or application phase of point life history. Tips would be broken during use when a bone was struck during butchering or the point used for prying. Tips would presumably have been discarded on location and so, like FCR that has fallen below the threshold of utility, mark the spot of their last use.

- *Medial fragments.* Medial fragments imply extended action. Medial fragments must represent use after the tip was broken. They represent extended use of a point, probably in circumstances in which refurbishing the tool was delayed by the need to proceed with the task. They should be found in use areas and mark the location of their last use.

- *Basal fragments.* Basal fragments represent the refurbishing stage of point life, in which an implement is refurbished by removing the broken point and replacing it with a new one. They would probably be found in a lithic reduction area of a site, and imply the presence of appropriate materials such as resin, sinew, haft, and manufacturing materials or the presence of a pre-manufactured point imported from another location.

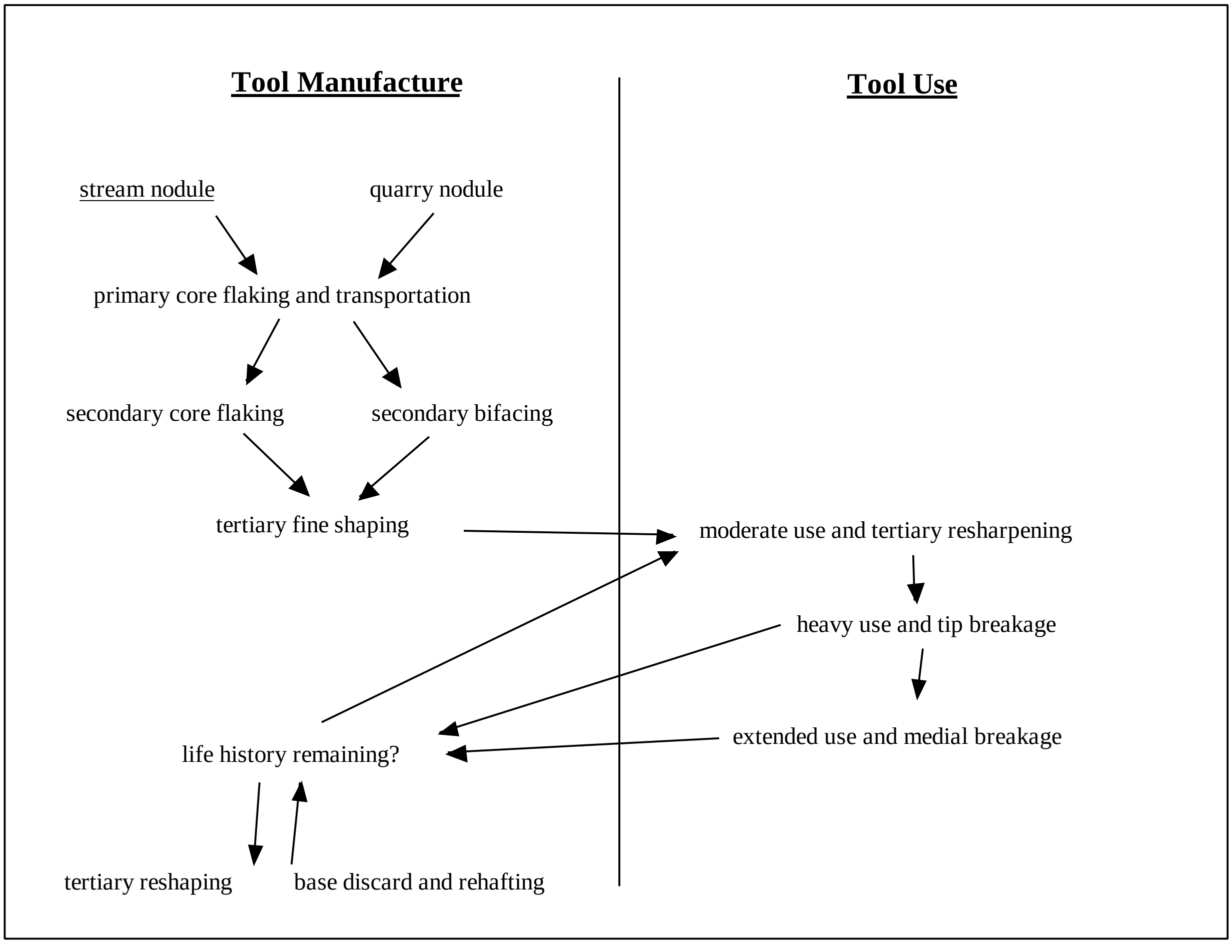


Figure 5.5. Flake-Point Reduction Sequence and Activity Implications.

- *Whole points.* Whole points represent the loss and/or storage phase of point life. While whole points are the most useful for chronology and display, finding them in sites raises the question of why they would have been abandoned. Since they possess their utility life, the implication is that they were lost, or perhaps they remained with the site as site furniture. Some points are known to have been stored across generations, as in the well-established Early Woodland practice of recycling Archaic points.

The debitage analysis followed categories used during Wakefield projects (Gunn, Idol et al. 1997; Gunn and Lilly 1997; data base is in Appendix 1). Debitage was divided into categories that reflect technology and reduction stage. Technology categories were core flaking and biface flaking. The reduction stages were core, primary, secondary, and tertiary flakes. Reduction stages were further distinguished as flake platform, medial and terminal fragments, and shatter/chunk fragments. Information on raw material type was recorded.

Since all chipping technology involves core flaking the raw material, a pure bifacing technology is unlikely except in special circumstances such as hunting stations, where only bifaces are present as preforms, bifaces, or points. Bifacing flakes were categorized based on platform profile [i.e., the platform has a "V" shape rather than "L" shape (Gunn and Brown 1982)] platform grinding, and other characteristics that tend to signal bifacing technology. If there was any doubt as to whether a flake was a bifacing flake, it was not categorized as such. Thus the biface flake category is conservative, while the core flake category is liberal. This approach allows for an estimate of the proportion of the assemblage that is securely bifacing. The core flake category contains all other flakes and flake fragments.

The data resulting from these analyses (Appendix 1) were used to address various questions concerning the chipped stone assemblage, including the chronological associations of various tool forms and patterns of raw material preference, production and use. The Neuse Levee flake data base was constructed by the same analyst who made observations on the Wakefield Creek sites, and thus the data bases should be consistent across projects.

Groundstone

Groundstone artifacts include tools such as hammerstones and celts, and ornamental objects such as pendants and gorgets. These artifacts were analyzed individually and categorized according to their morphology, the nature and extent of modification, and their apparent function.

Other Rock

Site 31WA1137 produced a small quantity of FCR and apparently unmodified rock. All rock recovered from feature contexts were returned to the laboratory and classified as either FCR or apparently unmodified rock. Samples of these materials were analyzed according to raw material type, but virtually all of it was granite/rhyolite.

FCR

FCR was grouped by size into six categories (Table 5.2). The sixth size group (<5 mm) was weighed rather than counted. FCR in this size range was suggested to be below the threshold of utility (Gunn and Wilson 1993), which means that the cracking process has proceeded through a number of recyclings of a rock until it no longer serves efficiently as a boiling stone. We suggest that rocks below the threshold of utility would have been left in place rather than moved around as larger stones of continuing utility were. They are therefore a better indicator of boiling activity location at a given point in time than larger FCR.

The types and frequencies of all artifact categories were recorded on spreadsheets and are listed in the Appendix 1 artifact catalog.

Table 5.2. FCR Size Group Descriptions.

Group	Minimum	Maximum	Units
VI	0	5	weight g
I	5	7	mm
II	7	9	mm
III	9	11	mm
IV	11	13	mm
V	13+	–	mm

Special Analyses

The previous investigations suggested that Neuse Levee would provide a variety of specialized data relating to each of the research domains. The specialized analyses conducted to recover this information included archaeobotanical, faunal, phytolith (Appendix 6, geochemical and sediment grain size; see Chapter 2), and OCR and radiocarbon dating (see Chapter 11). A multidisciplinary team was assembled to pursue the various special analyses. Each of these specialized analyses is discussed and described in some detail below.

Flotation Processing

Flotation samples were processed at the TRC laboratory in Atlanta, using a Flote-Tech system built by Dausman Technical Services. This unit consists of a self-contained 100-gallon, aluminum flotation tank powered by an electric pump, and uses both water and air to remove soil and separate artifacts into light and heavy fractions. The light fractions were air-dried and analyzed by Andrea Shea. All carbonized wood, bark, and nutshell at least 2 mm in size were counted and weighed. Cultigens, nuts, seeds, and other food remains were identified to the most specific taxon possible, and randomly selected charcoal fragments were identified by species to reconstruct the exploitation of botanical resources by the inhabitants of each site.

The heavy fractions from the flotation samples were separated into two fractions, one larger than 1/4 inch and one smaller than 1/4 inch. The larger fraction was analyzed following standard procedures. The smaller fraction was scanned for small diagnostic artifacts and faunal elements, and then discarded.

Faunal Analysis

No faunal remains were recovered.

Radiocarbon Dating

Radiocarbon samples were drawn from carbonized remains recovered from stratigraphic contexts during excavation; no carbon was found in the FCR features. The samples were first sent to Andrea Shea for species identification and then to Beta Analytic for dating. Every attempt was made to derive a range of dates that bracket the various episodes of habitation and utilization of the site. All dates were processed by Beta Analytic, Inc., of Coral Gables, Florida.

Oxidizable Carbon Ratio (OCR) Dating

A systematic column of soil and selected sediment samples from each site was analyzed using the OCR dating technique developed by Frink (1992, 1994) and others. The analysis was carried out by the Archaeological Consulting Team of Essex Junction, Vermont.

Phytolith Analysis

Recent studies (Rovner 1998; Webb 1995) have demonstrated the utility of phytolith analysis in providing paleo-environmental data in the southeastern Piedmont, and phytolith analysis was employed in the present project. Phytolith samples were processed and analyzed by Dr. Irwin Rovner of Binary Analytical Consultants, Inc., of Raleigh, North Carolina.

Ceramic Analysis

The ceramic analysis was conducted by Joel Gunn of TRC in consultation with Bruce Idol, who performed the Wakefield ceramic analysis. Steve Davis and Joe Herbert were also consulted.

Lithic Analysis

The lithic analysis observations were made by Steve Hatch and the analyses were performed by Joel Gunn. Bill Stanyard analyzed the stone tools.

Synthesis of Special Analyses

The synthesis of special analyses was performed by Joel Gunn.

SUPPORTING ACTIVITIES

Visits from OSA and Regional Specialists

Representatives from the OSA and regional specialists were invited to visit the site. Steve Claggett, State Archaeologist, and Dolores Hall of the OSA visited the sites two times. Tom Padgett, Gary Glover and Ken Robinson of NCDOT visited the site, as did Daniel Cassedy.

Permanent Curation

All artifacts, written records, photographs, and other project materials were curated temporarily at the TRC Garrow facilities in Atlanta and Chapel Hill. The permanent curation repository of all project materials and collections will be determined in consultation with NCDOT.

Management Summary

A detailed Management Summary documenting the successful completion of the fieldwork phase of the project was submitted to the NCDOT within one week of the end of fieldwork. Upon review and acceptance of this document, NCDOT was cleared to proceeded with construction in the area of the site.

Public Education Program

Public relations during the project included an interview by Ron Kemp of NCSU Creative Services for an NCSU/UNCW public television hour-long special on the history of the Neuse River basin that aired in May of 1999.